**Building a Web Application: Database Design**

Once we have our Requirements completed, we can begin modelling our data. Developing a data model can be a very straightforward task.

You determine what your objects are – otherwise known as entities – and then define the relationship between those entities.

The diagram that you will end up with is called an Entity Relationship Diagram or ERD for short.

## Entities

The first step is to define the entities. Break it down based on how you expect to store information. Anything that is a noun is likely to be an entity. Everything else will be attributes. Tasks, for example, are an entity. User Preferences on the other hand are descriptive. They describe Users. As a result, we’ll have a “Users” entity that stores user preferences.

Once you have all the entities defined, we can move onto defining the relationships between them. In doing so, we’ll likely find other entities that have to be created to pull off what we need.

It may not be everything that will end up in the final list of tables but it is a starting point for the next step.

## Relationships

Items can be related to each other in various ways:

* one-to-one
* one-to-many
* many-to-many

In a situation where an entity has a one-to-one relationship in both directions, chances are it can be combined into one database table. For instance, each site only has one site owner. Therefore, site owner information could be contained within the site table.

Many-to-many relationships cannot be represented in a relational database and will need to be resolved into one-to-many relationships. To illustrate this point, we have Users and we have Groups. I want a user to belong to more than one group. Likewise, a group can contain more than one user. As a result, we create a lookup table that stores a key from both tables.

The one-to-many scenario is the most common scenario. Examples:

* a milestone may have many tasks but a task will only have one milestone.
* a user may have multiple to-do items but a to-do item will only belong to one user.

Refine your relationships. Review your diagram, resolve many-to-many relationships and remove redundant relationships.

## Defining attributes

Now that we have our entities and how they are related to each other, it’s time to set the attributes of each entity. These attributes will be the field names in the database. Going back to our User entity, we can define attributes such as name, address and phone number.